

Patent Claims

1. A plate heat exchanger for the exchange of heat between a first (11, 12) and a second (13, 14) air stream, with a multiplicity of plates (1) which delimit exchange spaces (4, 5) lying next to one another in the transverse direction with respect to the plates (1), the first air stream (11, 12) being capable of flowing through some of the exchange spaces (4) and the second air stream (13, 14) being capable of flowing through the rest of the exchange spaces (5), the second air stream consisting of the exhaust air (13) which originates from the rooms to be ventilated and which, conducted through the exchange spaces (5) of the heat exchanger, is to be discharged as outgoing air (14) outside the rooms to be ventilated, characterized in that a water distribution system (20, 21; 17, 9) is provided, by means of which water can be discharged into the exchange spaces (5) of the second air stream (13, 14).

2. The plate heat exchanger as claimed in claim 1, characterized in that the water distribution system (20, 21) has a multiplicity of nozzles (21), by means of which the water can be sprayed as a fine mist and can be discharged thus into the exchange space (5).

3. The plate heat exchanger as claimed in either one of claims 1 or 2, characterized in that, in the lower region of the heat exchanger, a water collection device is provided, by means of which the collected water can be discharged, in particular, via a siphon.

4. The plate heat exchanger as claimed in one of claims 1 to 3, characterized in that at least in each case one plate (1) belonging to each exchange space (4) of the first air stream (11, 12) is designed conductively, and in that, in the region of the supply

(11) of the first air stream (11, 12), an ionization device (6) is provided, by means of which particles entrained in the air stream can be ionized, so that these are deposited on said conductive plates in the  
5 exchange spaces (4) of the first air stream (11, 12).

5. The plate heat exchanger as claimed in claim 4, characterized in that the ionization device comprises an ionization filament network (6) charged with a  
10 direct high voltage, and in that said conductive plates (1) are at ground potential.

6. The plate heat exchanger as claimed in claim 4 or 5, characterized in that the water distribution system  
15 (17, 9) can be controlled in order to spray water periodically into the exchange spaces (4, 5) in order to purify the plates (1) of the heat exchanger and the ionization device (6) of deposited particles, bacteria, algae and other deposits.

20 7. The plate heat exchanger as claimed in one of claims 4 to 6, characterized in that said water distribution system (8, 7, 17, 9) is also provided in the region of the ionization device (6), so that water  
25 can be discharged into the exchange spaces (4) of the first air stream (11, 12).

8. The plate heat exchanger as claimed in claim 7, characterized in that at least parts of the said  
30 conductive plates (1) of the first air stream (11, 12) have a purification-acting region which consists of high-grade steel bearing the material numbers 1.4571 or 1.4301.

35 9. The plate heat exchanger as claimed in one of claims 1 to 8, characterized in that the first (11, 12) and second (13, 14) air streams flow through the exchange spaces (4, 5) in countercurrent.

10. The plate heat exchanger as claimed in one of  
claims 1 to 9, characterized in that the supply (13) of  
the second air stream (13, 14) is arranged in the upper  
5 region of the heat exchanger, in that the discharge  
(14) of the second air stream (13, 14) is arranged in  
the lower region of the heat exchanger, and in that the  
water distribution system (20, 21; 17, 9) is arranged  
in the upper region above the plates (1) of the heat  
10 exchanger.